72.04

32.87283 -116.45479

Evaluation (Insects)

5230
February 18, 1972

ENVIRONMENTAL IMPACT EVALUATION
LAGUNA MTN. BARK BEETLE CONTROL PROJECT
CLEVELAND NATIONAL FOREST

According to field surveys, approximately ~~1,100~~ 6,000 trees ranging in size from 12 to 50 inches up to 50 inches dbh will be treated on 5,000 acres. At present the best method to attain suppression is through maintenance control. One part of maintenance control is direct control, i.e., the infested trees will be logged, removed by woodcutters or felled and sprayed with an insecticide. The most effective registered insecticide is lindane. Individual infested trees will be felled, bucked and limbed. A 1.5 percent solution of lindane and diesel oil will be applied to the bark with a low pressure sprayer.

This impact evaluation is for the treatment of insect infested trees with lindane (gamma-isomer of BHC).

I. ENVIRONMENTAL IMPACT

Lindane spray will be applied in low dosages to individual felled trees. Lindane-diesel oil forms a tissue deposit (no lindane on bark surface), so environmental contamination will be kept to a minimum. One of the major concerns of organochlorine compounds, such as lindane, is that it may be transferred in the food chain through a phenomena called biological magnification. Dr. Francis Gunther (personal communication, Branch of Pest Control, Region 5), Chemist and Toxicologist, at the University of California (Riverside) stated that he knew of no instances where lindane went through biological magnification. Dr. Gunther is the editor of the 1970 edition of Residue Reviews and a renowned authority on insecticides. Macek (1970) said that lindane and methoxychlor would not be expected to be biologically magnified to any great degree.

A. Air

Lindane is stable to air, light, heat, and carbon dioxide. (Martin, 1968) No air pollution should occur through treating felled trees with a lindane-oil solution.

B. Natural Beauty

Much of the area is visible from roads and trails. Because of the small number of trees to be felled the visual impact will be negligible. Slash created by insect control work will be handled in a manner that is consistent with the objectives of the Ranger District Multiple Use Plans and the Sub-Regional Guidelines. The removal of sorrel, and red-top trees from near and distant view areas will enhance the natural beauty, not detract.

C. Range and Plant Life

Lindane is considered to be nonphytotoxic at insecticidal dose levels.

D. Soils

With proper application procedures, very little of the lindane-oil solution should reach the soil. Lindane is moderately stable in soil but is fairly resistant to removal from the site of application by physical factors. (Lichenstein, 1959) Also, lindane degrades in soil to pentachlorocyclohexene (PCCH) which is more volatile than lindane, and does not remain in the soil to any extent. (Guenze, 1970)

E. Water

There are no lakes in the actual project area and only a few intermittent streams. However, no infested trees will be felled in these stream courses. Lindane has very little movement in the soil, hence, there should be no effect on water quality or stream flow.

F. Fish and Wildlife

With the low dosage and direct application to the bark of felled trees, no effect on fish and wildlife is expected. Keeping away from streams is mandatory.

Fish. Generally most insecticides are toxic to fish. The chlorinated hydrocarbons are particularly toxic. However, lindane is considered to be one of the safer chlorinated hydrocarbons. (O'Brien, 1967)

Brown and rainbow trout were all killed by exposure to 0.05 ppm of lindane, but bluegills have survived 0.45 ppm of 12 percent lindane. However, bass and bluegill fingerlings suffered 50 percent mortality at 0.1 ppm of the same formulation. (Rudd, 1956) Four species of fish were exposed to water containing 0.03 ppm lindane. Two days after termination of exposure, the fish had eliminated 90 percent of the lindane. (Gakstatter and Weiss, 1967)

Birds. Numerous tests have been made feeding various birds on a diet of certain percentages of lindane. A 10 percent mortality of pheasants resulted from eating grain treated with one and two-thirds ounces of 75 percent lindane per 100 pounds over a 20-day period. However, other investigators were unable to detect noteworthy changes in the bird population of a 40 hectare pasture and woodland treated with 10 percent BHC (10 percent gamma) at approximately 50-70 pounds per acre. This application is about twice that normally employed. In

addition, considerable field observation and experimentation in Germany have led essentially to the same conclusion. The small amounts of BHC that a wild bird could ingest would be insufficient to cause harm, due to the rapid disintegration of the material (BHC) within the animal body. (Rudd, 1956)

In summary, the National Academy of Sciences (1969), indicates that field applications of lindane have no toxic effect on birds.

Animals. The chronic toxicity of BHC, with the exception of the beta isomer (this isomer not in lindane) is relatively low. Technical BHC and lindane have been rated as one half and one quarter, respectively, the toxicity of DDT. Minimal storage, rapid elimination from the body and lesser degree of tissue damage are the criteria for this rating. (Lehman, 1950)

According to the National Academy of Sciences (1969) mammals metabolize lindane quite rapidly to trichlorobenzenes and phenols, which are excreted, and thus accumulate very little in the body fat. Hence, in mammals it has a low oral toxicity. (O'Brien, 1967)

G. Man

The U. S. Department of Health, Education and Welfare reports that there have been no confirmed cases of systemic poisoning in man as a result of repeated exposure to BHC (comparable to lindane). A Roumanian study showed no ill effects from massive inhalation of DDT plus lindane in a forest spraying operation; some workers inhaled 21 mg/kg of DDT as well as 6 mg/kg of lindane daily for 30 days. (O'Brien, 1967) Lindane is absorbed through the skin and other portals. Lindane has moderate mammalian toxicity. It is also rapidly excreted by the kidneys and hence does not accumulate extensively. It therefore has the lowest toxicity on repeated dosages. (Hayes, 1963)

H. Wilderness Areas

There are no wilderness areas in the project.

II. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

A temporary reduction of certain beneficial and associated insects as well as some soil arthropods is probable. Two common predators of the western pine beetle, Enoclerus lecontei and Temnochila chlorodia, are quite easily killed by lindane. (Swain, 1968)

III. ALTERNATIVES TO THE PROPOSED ACTION

A. Log Infested Trees

This method is very desirable; however, it is extremely difficult to remove all of the infested trees before bark beetle emergence. Also, recreation and heavily urbanized areas are usually not suitable for logging. However, this method should be used whenever possible.

B. Removal of Infested Trees by Woodcutter

Usually only a small number of trees can be handled in this manner as it is difficult to remove the trees before insect emergence. Another problem is that the infested material must be removed from the forest environment otherwise control is not accomplished. Hence, this precludes the use of local woodcutters.

C. Fell, Peel and Burn Infested Trees

The fire hazard in southern California generally will not permit this type of treatment. Also the effects of charred debris and scorched vegetation is undesirable in most of the areas. Unfortunately, in most areas local Air Pollution Control Board ordinances prohibit burning.

D. Use Ethylene Dibromide Instead of Lindane

Ethylene dibromide is a fumigating insecticide and has limited effectiveness, particularly in cold weather. Because of its short residual qualities, it may not render the uninfested portions of treated trees toxic to slash-breeding insects. Ethylene dibromide poses a greater hazard to treatment crews than does lindane as it is notorious for causing skin irritations resulting from direct contact. Breathing its fumes may cause lung irritation.

E. Discontinue Insect Control Work in the Area

This should be regarded only as a theoretical alternative as it would have an intolerable adverse effect on the land value and the forest resource that people value for temperature modification, recreation, esthetics, shade and timber production.

IV. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

There are no irreversible commitments except the finality of cutting a tree which would soon become a snag. Some snags always remain for wildlife habitation. Also, tree regeneration may take place in areas where trees have been cut.

V. CONSULTATION WITH OTHERS

On a special and continuing basis there has been consultation with State agencies, Universities, other Federal agencies, and local review through the District Ranger and Forest Supervisor.

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February 11, 1972

COST-BENEFIT EVALUATION
LAGUNA MTN. BARK BEETLE CONTROL PROJECT
(MAINTENANCE CONTROL)

CLEVELAND NATIONAL FOREST

Control of the California flatheaded borer is carried out on Laguna Mountain under a maintenance control program. These objectives are defined in the Insect Control Plan prepared for the Descanso Ranger District.

RESOURCE VALUE

The Laguna Mountains represent the largest block of public owned coniferous timber in San Diego County. In 1970 the recreation use on the Cleveland National Forest was 1,525,700 visitor days. San Diego currently has 1.4 million people with 2.5 million predicted by 1990. The recreation impact on Laguna Mountains will be tremendous. An active land exchange program is in progress which will bring much needed recreation land under public ownership. It is necessary to give this valuable recreation and timber land the highest degree of protection possible. Continued tree loss would have an intolerable adverse effect on the land value, and the forest resource that people value for recreation, esthetics, shade, and timber production.

SUPPRESSION COSTS

Estimated suppression costs for Fiscal Year 1973 are estimated to be $12,650 to treat approximately 1,100 trees.